

REMARKS

With respect to “Information Disclosure Statement” on page 2 of the Office Action, it is pointed out that the Information Disclosure Statement that cited the references states “Copies of the documents are not being provided, because copies are furnished directly by WIPO under an exchange program among the PTO, the EPO and the JPO. If the copies were not furnished and a copy of a cited document is desired, a copy will be supplied if the undersigned is called.” Thus, copies should have been furnished directly by WIPO, but if the copies were not furnished and the Examiner desires a copy of a cited document, a copy will be supplied if the undersigned is called. Consideration of the references is respectfully requested.

With respect to “Specification” on page 2 of the Office Action, “grained” was intended in line 6 on page 11 of the application. The cutting fluid is more minutely grained by the flow energy of the atomized cutting fluid.

With respect to “Claim Objections” on page 2 of the Office Action, the applicants point out that claim 5, as presented in the Preliminary Amendment, is not a multiple dependent claim. The Examiner’s objection on this ground leads the applicants to believe that the Examiner has examined the original claims rather than the claims of the Preliminary Amendment. The Examiner’s proposal for amending claim 3 has been adopted.

Reconsideration of the rejection of claims 1-5 under 35 USC 103 as being unpatentable over WO/37439 in view of Inoue ‘212 is respectfully requested. The Examiner acknowledges that WO99/37439 lacks an opening degree changing means for changing degrees of openings at the rear ends of the cutting fluid feed passages, but contends that Inoue ‘212 makes obvious the addition of an opening degree changing means to the apparatus of WO99/37439. In fact, Inoue

‘212 teaches away from adding an opening degree changing means for changing degrees of openings at the rear ends of the cutting fluid feed passages. The Inoue ‘212 reference relates to a cutting-oil coater for applying cutting-oil to a workpiece or a tool during cutting. Column 4, lines 16-22 disclose: “The oil spray passing through the spray conveying passage 4 finally is discharged into the atmosphere from a tip 4a having a narrower diameter. The flow velocity of the oil spray is increased at the tip 4a, and the oil spray is changed to the state of an oil droplet so that it can be attached to a work piece. This discharging flow can be used as a lubricant for cutting.” Thus, the spray conveying passage 4 is the part of the Inoue ‘212 apparatus that is the closest to the point of lubrication. In this respect, the spray conveying passage 4 is the part of the Inoue ‘212 apparatus that is more analogous to the cutting fluid feed passages ‘b’ of WO/37439 than is any other part of the Inoue ‘212 apparatus. However, Inoue ‘212 does not disclose or suggest placing an opening degree changing means at the rear end of the spray conveying passage 4. Instead, Inoue ‘212 discloses placing a needle 43 in the oil inlet port 42 of a tank to vary the flow of oil flowing from an oil return passage. The oil inlet port 42 is at the bottom of the container 2, whereas the spray conveying passage extends out of the top of the container. Thus, Inoue ‘212 does not disclose or suggest adding an opening degree changing means for changing degrees of openings at the rear ends of the cutting fluid feed passages of WO/37439. One of ordinary skill who viewed these two references at the time the present invention was made would not have any incentive for placing any structure like the needle 43 of Inoue ‘212 in either the spray conveying passage 4 of Inoue ‘212 or the cutting fluid feed passages ‘b’ of WO/37439.

Reconsideration of the rejection of claims 1-5 under 35 USC 103 as being unpatentable over WO/37439 in view of JP 05162046 is respectfully requested. The Examiner acknowledges

that WO99/37439 lacks an opening degree changing means for changing degrees of openings at the rear ends of the cutting fluid feed passages, but contends that JP 05162046 makes obvious the addition of an opening degree changing means to the apparatus of WO99/37439. In JP 05162046, a needle valve is provided at an exit where lubricant inside a tank is pushed out by a piston 4. The mere disclosure that a needle valve is used in connection with the flow of a lubricant does not suggest or render obvious modifying WO99/37439 to provide opening degree changing means for changing the degree of opening of openings that are at the rear ends of the cutting fluid feed passages, as is required by claims 1 and 2. In fact, JP 05162046 teaches away from this, since it discloses delivering the lubricant peripherally through a tube to the point where the work is being performed rather than through cutting fluid feed passages that are at rotating centers of spindles, as is recited in claims 1 and 2.

Reconsideration of the rejection of claims 1-5 under 35 USC 103 as being unpatentable over WO99/37439 in view of Eckardt is respectfully requested. The Examiner acknowledges that WO99/37439 lacks an opening degree changing means for changing degrees of openings at the rear ends of the cutting fluid feed passages, but contends that Eckardt makes obvious the addition of an opening degree changing means to the apparatus of WO99/37439. Claims 1 and 2 recite a plurality of spindles, cutting fluid feed passages at rotating centers of the spindles, a common closed chamber at rear parts of the spindles, atomized lubricant fed to the common closed chamber adapted to jet from the tips of the corresponding tools through the cutting fluid feed passages, and opening degree changing means for changing the degree of opening of openings at the rear ends of the cutting fluid feed passages. Eckardt has none of these features. Although Eckardt discloses needle valves or valve plugs 34 in a valve block 33 for adjusting the flow rate of fluids through the block, it would not have suggested to one of ordinary skill to use

such an arrangement to change the degree of opening of a plurality of openings at the rear ends of the cutting fluid feed passages of WO99/37439, which are at rotating centers of spindles. Eckardt shows a coolant and lubricant nozzle 39 that is separate from an apparently solid drill bit W. Furthermore, Eckardt stresses the importance of manually regulating the flow of each of coolant, lubricant and air (column 1, line 68 – column 2, line 2), and for this reason, he provides three needle valves 34, one for each medium. Thus, also for this additional reason, Eckardt would not have suggested to one of ordinary skill to place one of the needle valves 34 of Eckardt, or three of them (if it were possible), to change the degree of opening of a plurality of openings at the rear ends of the cutting fluid feed passages of WO99/37439.

With respect to each of the rejections, it is pointed out that claims 1 and 2 recite a plurality of spindles, cutting fluid feed passages at rotating centers of the spindles; and opening degree changing means for changing the degree of opening of openings at the rear ends of the cutting fluid feed passages. Thus, claims 1 and 2 recite means for changing the degree of opening of plural openings at the rear ends of the cutting fluid feed passages. This is not suggested by the references, whether taken individually or in combination. In each of the modifying references the variation in flow is performed at a source of supply rather than at the rear ends of the cutting fluid feed passages, and does not suggest adjusting the amount of flow of plural openings at the rear ends of the cutting fluid feed passages. By the present amendment, claims 1 and 2 have been amended to recite that the opening degree changing means is opening degree changing means for changing the degree of opening of plural openings at the rear ends of the cutting fluid feed passages.

Also with respect to each of the rejections, it is pointed out that claims 1 and 2 recite that atomized lubricant fed to the common closed chamber is adapted to jet from the tips of the

corresponding tools through the cutting fluid feed passages. Thus, the opening degree changing means acts on atomized lubricant. In order to recite this feature even more clearly, claims 1 and 2 have been amended to recite the changing means as "opening degree changing means for changing the degree of opening of openings at the rear ends of the cutting fluid feed passages to change the flow rate of atomized lubricant into the cutting fluid feed passages." In each of the modifying references applied by the Examiner, fluids other than atomized lubricant are controlled. In Inoue '212 and JP 05162046, liquid oil is controlled; and in Eckardt, liquid coolant, liquid lubricant and air are controlled individually.

In view of the foregoing, the applicant submits that all the claims are allowable and that the application is in condition for allowance. An early notice to that effect is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0562.

Respectfully submitted,

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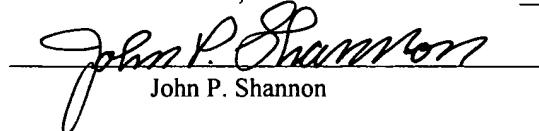
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